Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOL. XIII. NEW YORK, OCTOBER 24, 1857. NO. 7.

THE
SCIENTIFIC AMERICAN,
PUBLISHED WEEKLY
At No. 128 Fulton street, (Sun Buildings,) New York,
BY MUNN & CO.

O. D. MUNN, S. H. WALES, A. E. BEACH.

Responsible Agents may also be found in all the principal cities and towns in the United States.

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Single copies of the paper are on sale at the office of publication and at all the periodical stores in this city, Brooklyn and Jersey City.

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Official Report on Fire-Arms.

By reference to Nos. 1 and 2 of this volume, our readers will find an interesting account of the trial of fire-arms which took place a short time ago at West Point, N. Y. The Board appointed to conduct the experiments have recently reported to the Secretary of War as follows:—

"After a full and careful consideration of the merits of each arm tried, the Board are of unanimous opinion that the breech-loading rifle submitted by General Burnside, of Rhode Island, is the best suited to the military service, as the breech-loading arm is thought to be ample and strong in its parts, and therefore less liable to get out of order than any other.

"In expressing this opinion they do not wish to be understood as disparaging the merits of the other guns, for they consider that some of them possess much more merit, and evince much ingenuity in their construction.

"They feel it their duty to state that they have seen nothing in these trials to lead them to think that a breech-loading arm has yet been invented which is suited to replace the muzzle-loading gun for foot troops; on the contrary, they have seen much to impress them with an opinion unfavorable to the use of a breech-loading gun for general military purposes.

"Although the Board were ordered to give an opinion upon rifles alone, the attention of members was called to Colt's revolving pistol fitted upon a movable rifle stock. It performed so well that they recommend it to the Secretary of War as a superior arm for the mounted service, and suggest a Board of dragoon officers to test it thoroughly.

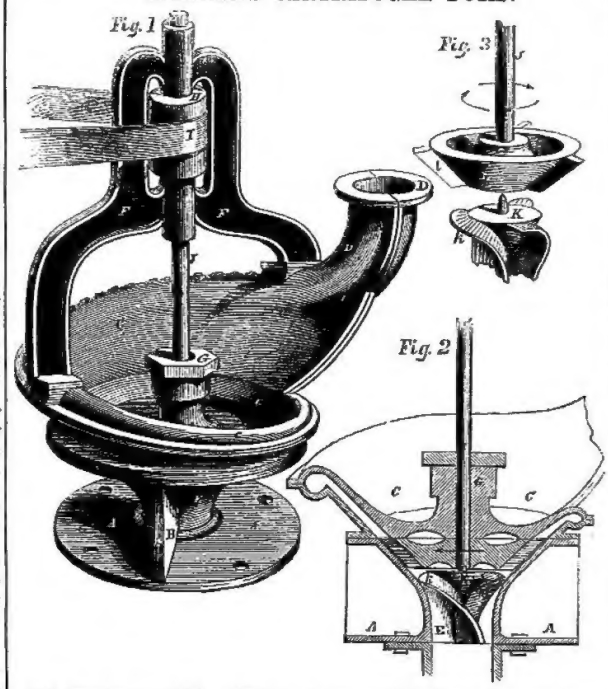
"Nineteen different patterns of arms were tested by the Board."

[We would like to inquire if there is any truth in the report that the Board have been feasted at the expense of General Burnside? Such is the rumor.

The Vicissitudes of Commerce.

A few months since, the partner of a commercial house in this city was taken to a lunatic asylum, utterly deranged, as was said, by his unparalleled prosperity in business. During the year previous, his firm had cleared $1,300,000. He died in the asylum, and his own estate was valued at $2,500,000, all invested in the concern of which he was a partner. The firm itself failed the other day, and is now said to be utterly insolvent. One item of the assets of the deceased's estate was one thousand shares of the Illinois Central Railroad stock, which was selling at the time of his decease, at $140 a share, and which was worth, after paying up the instalments, $800,000. The same property sold lately at public sale at $50,000. All this occurred within eighteen months—the prosperity, the insanity, the decease, and the insolvency.

ANDREWS' CENTRIFUGAL PUMP.



This invention is certainly entitled to a place of no small merit among the array of appliances for raising water which everywhere met our view in strolling through the Crystal Palace. The common suction pump, the simplest and oldest of pumps, is in many cases "shelved" in places where a continuous stream is required, and rotary ones, in a great measure, take its room. Now to rotary pumps there is a slight, but very slight, objection, and that is, that in sending the water round such a sharp curve as is usual, a large amount of power is expended in overcoming the resulting friction. The pump we are about to describe endeavors to overcome this difficulty by drawing the water up a spiral passage, and making it strike the revolving piston at the angle which it will continue in its passage through the pumps.

In our engravings, Fig. 1 is a perspective view of the whole arrangement; Fig. 2 a section through the pump; and Fig. 3 shows the piston and spiral piece separated. Similar letters refer to the same parts in each.

A is the bottom flange, to which is screwed the suction pipe, and which forms the base of the pump. B is a piece supporting and giving strength to the body of it, C, which is formed of a spiral tube, increasing in diameter to the delivery pipe, D. E is the neck or narrow portion. F a support for the piston rod, J. G is the stuffing box, H the pulley, and I the band.

In Fig. 2, K is a concave-shaped cone, having three spiral pieces or flanges, *k*, so placed on it as to divide the suction pipe into three passages, and it is firmly fixed in the pump; on its top is a small stud or pin, projecting as seen at Fig. 3, and this forms the lower axle of the piston, L, which carries three small fan-like projections from its surface, *l*, and these by revolving very quick produce the vacuum, and drawing up the water, it meets them at exactly the angle which it will have to continue in its exit, so that no force is lost in twisting the water round, as every one knows it is much easier to send water on in the way it is already moving than to send it on in any new direction.

This is one of the most perfect pumps we have seen; and persons interested can judge for themselves by going to the Crystal Palace, where there are two at work. It was patented in America, August, 1854; and Great Britain and France, November, 1856.

This pump is the invention of W. D. Andrews, 414 Water street, New York, from whom all particulars may be obtained.

Metal Work.

Works executed in metal should have a distinctive character about them, differing in treatment from those employed when the work is executed in other materials, such as wood, glass, or stone. In metal work, the ductility and tenacity of some of the metals—the value, color, and power of reflecting light in others—are elements which ought to be considered in the design and execution. Nothing is more common at the present day than to see the conditions reversed (that is, to see imitations in cast iron of what should be wrought), a form copied in the most fragile of metals which was originally produced in the most ductile—or attempts made to substitute, by means of the molder's art, the triumphs of the hammerman's skill. In works of this class, in the ancient and middle ages, the conditions were rarely reversed. Fitness in material and in purpose was observed, and ornamentation was always subordinate to the purpose. Thus, in the preparation of the metal work for the ark in the tabernacle, and for Solomon's temple, those portions exposed to much wear and tear, or which were required to sustain great weight, were of solid and substantial make, while those for a merely ornamental purpose were slight. As an instance of the success to which the art of casting at that early period was carried, it has been estimated by competent judges, that the weight of one of the castings of a pillar in the temple must have been equal to nearly twenty tuns.

Air Poison.

People have often said that no difference can be detected in the analyzation of pure and impure air. This is one of the vulgar errors difficult to dislodge from the ordinary brain. The fact is that the condensed air of a crowded room gives a deposit, which, if allowed to remain a few days, forms a solid, thick glutinous mass, having a strong odor of animal matter. If examined by the microscope, it is seen to undergo a remarkable change. First of all, it is converted into a vegetable growth, and this is followed by the production of multitudes of animalcules—a decisive proof that it must contain certain organic matter, otherwise it could not nourish organic beings. A writer in *Dickens' Household Words*, in remarking upon this subject, says that this was the result arrived at by Dr. Angus Smith, in his beautiful experiments on the air and water of towns, wherein he showed how the lungs and skin gave out organic matter, which is, in itself, a deadly poison, producing headache, sickness, disease or epidemic, according to its strength. Why, if a few drops of the liquid matter, obtained by the condensation of the air of a foul locality, introduced into the vein of a dog, can produce death by the usual phenomena of typhus fever, what incalculable evils must not it produce on those human beings who breathe it again and again, rendered fouler and less capable of sustaining life with every breath drawn! Such contamination of the air, and consequent hot-bed of fever and epidemic, it is easily within the power of man to remove. Ventilation and cleanliness will do all, so far as the abolition of this evil goes; and ventilation and cleanliness are not miracles to be prayed for, but certain results of common obedience to the laws of God.

Inlaid Work.

The Mosaic Art seems to be Italian, and was known in Rome from the days of the Republic. Under the Empire the art was greatly improved, and not merely by the introduction of marbles of several colors, but by the invention of artificial stones, termed by the Italians *smalti*, which can be made of every variety of tint. On the introduction of pictures into churches, they were first made of Mosaic. The art of Mosaic was, however, perfected in the last and present century, as now practiced. The minute and numerous pieces of colored marble, or artificial stone, are attached to a ground of copper by means of a strong cement of gum mastic and other materials, and are afterwards ground and polished as a stone would be to a perfectly level surface.

There are several kinds of Mosaic, but all of them consist in embedding fragments of different colored substances (usually glass and stones) in the manner just described, so as to produce the effect of a picture. The beautiful chapel of St. Lawrence, in Florence, which contains the tombs of the Medici, has been greatly admired by artists, on account of the vast multitude of precious marbles, jaspers, agates, avanturines, malachites, etc., applied in Mosaic upon its walls.

Patent Claims

Issued from the United States Patent Office

FOR THE WEEK ENDING OCTOBER 13, 1857.

[Reported officially for the Scientific American.]

ROTARY EXHAUST REGULATOR FOR LOCOMOTIVES—E. R. Addison, of Baltimore, Md.: I do not claim the employment merely of revolving nozzles of varying size to effect the change of the escape through them alone, as in the patent of A. W. Roberts, dated May 8, 1855, nor do I claim a sliding series of conical openings, as in the variable exhaust pipes pipes of F. Espenshade, patented March 14, 1854.

But I claim the arrangement of a variable series of openings in a revolving skeleton wheel moved by gearing from the outside of the locomotive steam boiler, substantially in the manner described, when combined with the close case for excluding the ashes from the wheel, and thus securing its perfect operation in the manner described.

MACHINE FOR CLEANING RICE—Wilson Ager, of Rohrsburg, Pa.: I am aware that reticulated concaves have been used, and make no claim for that portion of my machine; neither do I claim an independent adjustment of rubbers, such as is shown in the patent of Clark Jacobs, 1856; nor do I claim broadly the construction of the rubbers with brush and sheepskin surface.

But I claim the conical rubbers, R R', having the separate adjustment described, in combination with a single reticulated casing, operating substantially as and for the purposes set forth.

RAILROAD CAR SEATS—Chas. P. Bailey, of Zanesville, O.: I am aware that an entire car seat has been made which was reversible on its supports; this I do not claim.

But I claim a detached reversible back to a car seat, when combined with a seat in such manner that said back and seat may have a falling or backward adjustment together, though separately connected to the frame, substantially in the manner and for the purpose set forth.

SASH SUPPORTER—Nathaniel E. Baker, of Holyoke, Mass.: I do not confine myself to any precise form of spring to be applied to the plates, C D, nor to any precise material for the cord, E.

I claim the clamp formed of the plates, C D, attached to the sash, B, in combination with the cord, E, arranged substantially as and for the purpose set forth.

[This invention consists in a clamp attached to one side of the sash; this clamp is made to sustain or hold the window by griping a cord, which is placed in one of the jamb posts or stiles of the window frame, thus not being liable to become loose, or to swell by the action of the weather and tighten so much as to be useless.]

FOLDING CHAIR FOR CHURCH PEWS—Moses S. Beach, of Brooklyn, N. Y.: I do not claim broadly to be the first inventor of folding chairs, the back and legs of which are hinged, for they are well known.

But I claim the employment of the brace, F, when arranged as described, so as to serve the treble purpose of a brace or stop for the lock, D, and the leg, E, and also as a stop to prevent the back, D, from opening laterally when the chair is folded against the pew.

SAW FILER—A. M. Beardsley, of White Pigeon, Mich.: I claim the arrangement of the centrally pivoted plate for carrying and supporting the file carriage, in combination with the adjusting index and set screw, whereby the adjustment of the files for filing the right and left bevels of the teeth is effected, without shifting or changing the implement from one side of the saw to the other, as described.

Second, The employment of a pair of removable extension legs, in combination with the implement, whereby it is adapted to file circular saws of varying diameters, in the manner set forth.

Third, Arranging and sustaining the implements or main plate upon which the file carriage is mounted, at an angle to the radial extension legs, as shown in Fig. 1, for the purpose of regulating or governing the pitch or hook of the teeth being filed, in the manner set forth.

Fourth, Securing the files in their holders in such manner that they can be adjusted to vary the relative angles thereof, and adapt them to the teeth of different sized saws as described.

Fifth, Mounting the two files in removable holders, so that they can be taken out of the brackets which support them, and be reversed longitudinally without disturbing the relative angles or set of the files, as described.

MACHINE FOR BENDING WOOD—C. F. Beverly, of Lancaster, O.: I claim the stationary mold, F, and arms, G G, arranged and operated as shown, or in an equivalent way, for the purpose of bending the stuff, R, from its center outwards or towards its ends, as described.

I further claim attaching the arms, G G, to an adjustable block, H, operating in connection with the lever, L, as shown, for the purpose of allowing the stuff to be readily inserted or adjusted between the mold, F, and strap, M, as described; and also for properly holding the stuff to the mold while the stuff is being acted upon by the rollers of the arms, G G.

[A notice of this will be found on another page.]

MACHINE FOR SEPARATING SLATE AND OTHER FOREIGN SUBSTANCES FROM COAL—Eugene Borda and D. Glover, of Woodside, Penn.: I claim separating coal from slate by the apparatus above described, or in any equivalent manner, when the mass to be separated is conveyed by an inclined plane to the outside of a horizontal revolving cylinder, composed of bars parallel to its axis of revolution, substantially as specified.

PREPARING FATS FOR CANDLE MAKING—M. W. Brown, of Buffalo, N. Y.: I am aware that soluble soap for washing and cleansing purposes is well known, and has has long been used, therefore I do not claim its manufacture, application and use for any such purpose.

I am also aware that insoluble lime soap has heretofore been used in the manufacture of candles, therefore I do not claim its manufacture, application or use for such purpose.

But I claim, first, The employment of a soluble soap, as a base upon which to work my process for converting the same into stearic acid candles, substantially as set forth.

Second, I claim the application and use of the sulphate of soda and its equivalent corresponding salts in admixture with soluble soap, before a decomposition or change of the soluble soap into fatty acids for the purpose and substantially as set forth.

Third, I claim the application and use of dilute sulphuric acid, or its equivalent, in admixture with soluble or detergent soap for the purpose of decomposing or changing the soluble soap into fatty acids, substantially as set forth.

Fourth, I claim the use of spirits of turpentine, camphene or burning fluid, in admixture with the fatty acids while in the liquid state before and preparatory to the expression of the oleic acid oil therefrom by pressure, substantially as described.

CHURN DASHERS—I. N. Bock, of Elgin, Ill.: I claim the diamond-shaped brakers, E, in combination with the wheel, C, when formed and arranged in the manner and for the purpose substantially as set forth.

ARRANGEMENT OF SELF-DUMPING TRUCKS—Ze Butt, of Lincolnton, N. C.: I claim as my invention the self-dumping trucks, as shown and described; also, the adjustable double inclined plane, with ropes, pulleys, &c., together forming an improved horse-run.

CHURNS—Moses Byard, of Milan, Ind.: I claim the cylindrical vessel, B, or its equivalent, with a special opening or mouth in one side, and small oblong openings in its periphery, arranged and operating substantially in the manner and for the purpose specified.

CORN HUSKERS—Robert Bryson, of Schenectady, N. Y.: I do not claim the endless aprons, B C, and corrugated rollers, D D', E E', for they in connection with a guard have been previously used, and were formerly patented by me.

But I claim the reciprocating plate, t, placed in the bar, G, and having apertures, m, m, made through it, and provided with cutting edges, substantially as shown for the purpose of cutting the butts from the ears, the bar, G, having apertures, K, made through it, and the bar, t, operated in any proper manner.

[This is described on another page.]

HAIR TRIGGERS FOR FIRE-ARMS—P. F. Charpie, of Mount Vernon, Ohio: I claim the application of the curved spring, D, to work in a notch below the heel of the trigger, in such a manner that by pushing the trigger forward to set it, the said spring will be bent so as to develop its elasticity longitudinally or nearly so, and at the same time will be caused to exert a forward pressure on the trigger below its center pin, a, and thus keep it set, but that when the trigger is slightly drawn back, the spring will exert a pressure above the center pin, a, and thus throw up the heel suddenly, substantially as described.

[The great advantage of this invention is its simplicity, being composed of only two parts, while nearly all hair triggers have six or seven. The advantage is obvious.]

ORE SEPARATOR—Thos. J. Chubb, of New York City: I do not claim separating substances of different specific gravity by submitting them to the action of a blast of air through a screen.

But I claim, first, The arrangement of a series of strips of wood or metal forming a convex surface on top longitudinally and horizontal in a tranverse direction employed as a support for a perforated table or bed of wire cloth, or its equivalent.

Second, The arrangement of a sectional bellows and the mechanism for operating the same below the framing, and the perforated table or bed.

Third, The employment of a chain made of angular links riveted to strips, and connected together by pins forming an endless chain of scrapers in combination with a perforated table or bed for the purpose set forth.

PREPARING PAPER PULP FROM BEET AND OTHER REFUSE—R. H. Collyer, of Camden, N. J.: For making brown and white paper, and other paper manufactures, I do not mean to confine myself to the combinations and proportions above stated.

But I claim the exclusive use and employment for making paper and paper manufactures, in any combination or proportion whatsoever of the residue prepared, so as to retain and preserve the albumeno-mucilaginous substance, as before described, or in any other manner substantially the same of beet root, mangel wurtzel, and other species of the genus, beta, left after the sugar-making and distilling processes have extracted the saccharine matter.

HARVESTERS—Reuben Daniels, of Woodstock, Vt.: I claim, first, The combination of the carrying bands and the pressure feed roller, with the rake, when arranged and operated substantially as described.

Second, The combination of the spring comb with the rake carrying bands and pressure rollers, when arranged substantially in the manner and for the purpose described.

Third, The rake when arranged in the arms that support and give to it its reciprocating movement, as described, in combination with the mechanism for raising, lowering and turning it in these arms for the purpose set forth.

TWINE REELS—S. E. Davis, of Waterbury, Conn.: I claim the combination of the two spools, B C, connected by the cord or belt, D, and the box or receptacle, A, arranged substantially as and for the purpose set forth.

[By the employment of two reels the inventor saves the time ordinarily expended in filling twine reels when empty. It is specially intended for those who use twine in small quantities, as storekeepers and others.]

MANUFACTURE OF ARTIFICIAL HONES—Timothy Deming, of East Hartford, Ct.: I do not claim a compound of glue and emery for constructing and forming artificial bones, for this is a well-known composition, and is commonly used for such purpose.

But I claim the particular mode of applying such composition as described—that is to say, forming or constructing the hone by placing the composition in thin layers on the stock or bed, and subjecting each layer to a requisite degree of pressure.

[These hones will no doubt wear much longer and serve the purpose better than the ones in common use, as they will be harder, and are made with more regularity.]

SEED PLANTERS—Joseph Hall, of Honeyent, Ala.: I am aware that a great many seed planting plows have been brought into use, and I lay no claim to the originality of the principle of planting seed by a mechanical process.

But I claim the lever, L, carrying a movable bottom, M, on its upper end, in combination with the springs, S, and wheel, B, the whole arranged in the manner and for the purpose set forth.

SAW MILL—W. A. Flanders, of Troy, N. Y.: J. B. Drake, of Williamsport, Pa., and A. W. Fox, of Elmira, N. Y.: We are aware that an endless or belt saw is not new, and such simply we do not claim.

But we claim, first, Canting or inclining the saw pulley, B, forward and back, for the purpose described, by means of the slide post, T, and wedge, c, operated as described, or by any analogous means by which the same results are procured.

Second, We also claim the arrangement and combination of the track clearer, Y, the adjustable frame, D, the weighted lever, J, and saw, A, in the manner and for the purpose described.

APPARATUS FOR BARNS, STABLES, &c., FOR SECURING HORSES AND OTHER STOCK FROM FIRE—Joshua E. Hall, of Cleveland, O.: I claim the swing frames, E E', arm, J, and cord, H, and also in combination with the spring, V, and post, T, when the same is arranged substantially as set forth for the purpose specified.

CORN HUSKER—J. B. Heich, of Cincinnati, O.: I claim, first, The feeding rollers, E and F, in combination with the inclined feeder, K, and rotating knife, G, when said parts are constructed and arranged in relation to each other, in the manner and for the purposes set forth.

Second, The convex frame, S S', and grating, L, in combination with the inclined tapering cylinders, B B', provided with teeth as described, and rake, V, the whole constructed and arranged for joint operation as and for the purposes specified.

DITCHING MACHINES—Edward and Britain Holmes, of Buffalo, N. Y.: We claim the horizontal blade, D, the expanding side cutters, F, and elevating apron, h, when arranged and operating together substantially as set forth.

We claim the combination of the elevating belt, A, a, and compressing belt, H, or equivalents, with the elevating apron, b, for the purpose of taking the dirt from the apron, and continuing its passage up, until dropped on to the horizontal conveyer, substantially as set forth.

We claim the scraper, n, for the purpose of scraping the dirt from the elevating belt, and giving it direction so that it will fall upon the transverse conveyer, substantially as described.

GANG PLOWS—George W. Hildreth, of Lockport, N. Y.: I do not claim the arranging of plows in a gang so as to turn several furrows at the same time; nor the carrying it on wheels changeable in hight.

But I do claim the axle tree having a triple motion in combination with the center bolt and bolster plate, constructed and arranged substantially in the manner and for the purposes set forth.

MELODEONS—S. A. Jewett, of Cleveland, O.: I claim first, The production of a perfect mute, by combining the action of the air passages, m, N O, or their equivalents with the mute valve, L, as set forth.

Second, In the formation of a gradually increasing diminuendo, by means of operating the swell valve, T, by the rising and falling of the bottom board of the bellows or its equivalent, as specified.

SEALING RAILROAD CARS, &c.—P. W. A. Kranse, of Baltimore, Md.: I claim the employment of the dies, f g, when provided with holes, o o, therein, for the protection of the wire cord, and when said dies form a portion of the press for the purpose of impressing devices upon, and compressing the metal of the seal upon wire, substantially in the manner and for the purposes set forth.

PROJECTILES FOR RIFLED ORDNANCE—James H. Merrill, of Baltimore, Md.: I claim making the base of a projectile that is cast in one piece, cup or bowl-shaped, and slotting the metal between the hollow and the outside of the projectile, so as to allow said base to expand by the force of the gas, to fill the grooves or bore of the gun, substantially as described.

GUIDING LOGS IN SAWING GIVEN CURVATURES—Thomas Miles, of Greenbush, N. Y.: I claim giving to the top piece, F, of the tail block, a lateral motion, by means of the adjustable guide, I, substantially as and for the purposes set forth.

FASTENING SHAFTS AND POLES TO CARRIAGES—Thos. Miller, of Worcester Township, Pa.: I claim the combination and arrangement of key, a, and the slit, B, in the hook or pin to be used in connection with the other parts, so as to constitute an improvement in, and a new mode of fastening tongues or shafts to, axles in carriages and all kind of vehicles.

DIGGING MACHINE—James Mitchell, of Osceola, Iowa: I claim passing the pick handles through the rock shaft, C, and attaching them to the traversing bar, E, in combination with the arms, m and n, of shaft, G, studs, S, and springs, h, actuating said bar, the arrangement and operation being substantially as set forth.

HARVESTERS—N. A. Patterson, of Kingston, Tenn.: I claim connecting the axle, B, with the double tree, L, substantially as and for the purpose set forth.

[This invention will render the old harvesters of use, by removing the objection that they cannot be turned. By the employment of the movable double-tree, to which the horses are attached, and on which this patent is obtained, they are easily turned, and quite manageable.]

ORE WASHER—Joseph Paull, of Clifton, Mich.: I claim the basin, C, hopper, E, the conducting tube, F, and central shaft, G, all combined as described, and hung on a universal joint, and operated by a crank substantially as set forth.

[This ore washer will be found described on another page.]

WASHING MACHINES—Benjamin H. Pearson and Daniel B. Neal, of Mount Gilead, Ohio: We do not claim any of the members of this machine to be new, for they may all be found in every-day use, but we are not aware that the peculiar arrangement and operation of the devices which we have employed in our invention have ever before been used in this connection, and for this purpose.

But we claim the heads or disks, A A', in combination with the adjustable cross piece, F, constructed and operating in the manner and for the purpose set forth.

COTTON GIN FEEDERS—Jedediah Prescott, of Rockford, Ill.: I claim the endless toothed apron, B, placed in the hopper or box, A, in combination with the stripper and fan, D', and stationary teeth or comb, E', arranged substantially as and for the purpose set forth.

[This is described on another page.]

FLOODING VESSELS—John Quigley, of Saugerties, N. Y.: I claim the arrangement of the tube and chamber in relation to each other, to their parts and connections, and to the vessel, substantially as and for the purposes set forth.

ELASTIC COUPLING FOR MILL SHAFTING, &c.—Wm. S. Reeder, of St. Louis, Mo.: I claim, first, The method substantially as herein described of coupling and driving shafts for the the purposes set forth.

Second, The arrangement of springs, g and g, or any equivalent arrangement, when used in connection with shaft couplings substantially as set forth.

HOMINY MACHINES—Peter Siemers, of St. Louis, Mo.: Now a cylinder having corrugated knives or breakers has been used before in combination with the burred cylinder, as such an arrangement is shown in the application of Wm. Davis, but this arrangement only breaks the kernel and hulls it, but does not polish it, which is the function performed by the stone in my machine.

I am aware that mere substitution is not patentable, unless the thing substituted performs a separate function and is a real improvement, which the stone, in the relation I have placed it, really is.

I therefore claim the stone in combination with the corrugated knives and burred cylinder, when used for the purpose specified and operated as described.

GAS GENERATORS—Salmon Skinner, of Yonkers, N. Y.: I claim making the upper part of my retort dome-shaped, or any equivalent shape that will radiate its own heat, and in combination with such a retort, the interior protecting vessel, c c, and contents, or their equivalents, for the purpose of preventing the upper chamber of the retort from becoming unduly heated, thereby shielding the gas generated in the lower portion from decomposition before it can escape to the gasometer.

SAW FILER—Jonathan Smith, of Agawam, Mass.: I claim the combination and arrangement of the parts herein described, consisting of the gigs, regulating set, and center guide, in the manner and for the purposes specified.

STREET SWEEPERS—M. W. St. John and Isaac Brown, of Leonardsville, N. Y.: We claim the sockets or boxes H H, provided with brooms or scrapers L, and attached to the bar, A, by the universal joint, g, in combination with the adjustable shafts, F, attached to the bar, A, substantially as shown, for the purpose set forth.

I further claim in combination with the broom, socket or boxes, H, and adjustable shafts, F, the gate, K, applied to the implement as described, for the purpose specified.

[See notice on another page.]

CELLULAR IRON PAVEMENTS—S. H. Titus and O. Des Granges, of St. Louis, Mo.: We do not claim a cellular pavement presenting uniformity in the construction of its upper surface as such.

But we claim constructing each cell perfect in itself, and by such construction making the cells of the upper periphery of the block not only uniform, but answering as ledges to support the same upon the adjoining block, and thereby distributing the superincumbent weight equally along the whole side of the block, substantially in the firm manner described.

LASTING PINCERS—B. F. Sturtevant, of Skowhegan, Me., (assignor to Elmer Townsend, of Boston, Mass.): I claim the described compound pincers for lasting boots, constructed and operating in the manner substantially as set forth.

LOCK FOR FIRE-ARMS—Michael Tromley, of Mount Vernon, Ill.: I do not claim the employment of a toggle joint connection applied to a hair trigger.

But I claim the combination of the tumbler, j, toggle, e f g, trigger, D, link, p, lever, n, spring, r, screw t, and claw, f, or its equivalent, whether used as a hair trigger arrangement, without the use of a notch, m, in the trigger, or with the notch, m, as an ordinary trigger, substantially as described.

[This trigger can be used either as a hair or ordinary trigger, and will not go off on the mere shaking of the gun, as is sometimes the case with triggers on the hair principle.]

STRING FASTENING FOR SACKS, &c.—James A. Watrous, of Green Spring, Ohio: I claim the means of crimping or fastening the string or cord by means of the fixed and movable jaws with their elevated compressors, the movable jaw rising and falling in the slots in obedience to the lever, thereby fastening the string firmly at any point desired without chafing or cutting the same, when applied to the fastening of bags.

MAKING HAMMERS—Russell B. Perkins, of Meriden, Conn.: I claim arranging in the manner described the principal parts of a machine for forging hammers, that is to say, placing the rock shafts, a and b, upon which formers or dies are disposed in lateral series, at one end of the frame, A, and in the relative position specified to the rock shaft S, which operates the shearing, cutting and punching apparatus, in combination with the double cross head, B and n', placed at the reverse end of the frame, A, and deriving its motion from the crank, C.

I also claim the pin, u, so constructed and arranged in relation to the sliding plate, t", and lever, t"', that it will lock or unlock the rock shaft, S, to or from the collar, t, when required.

I also claim the combined cross heads, B and n', when so constructed and arranged that the cross head, n', may work in connection with the cross head, B, or separately within said B, as set forth.

I also claim the described contrivance for coupling or uncoupling the two cross heads, B and n', without stopping the crank motion, viz.: combining the shaft, p', of the two engaging and disengaging hooks, o, with the latch, p, the catch, r, and the lever, q, the whole being constructed, arranged and operated substantially in the manner set forth.

PROCESS OF COATING IRON—E. G. Pomeroy, of Philadelphia, Pa.: I claim the practical use and application of the described solution of hydrated sulphate of iron and copper brought in contact with the surface of the iron, in conjunction with the heat of the melted metal in the bath described, thereby producing a molecular separation of the particles of the iron, giving to them the susceptibility of forming a perfect flowing union or fusion together with the aforesaid metals in the bath in such a substantial manner as entirely to exclude a galvanic cement between the iron and the surrounding alloys, or any or either of them.

WAGON BRAKE—Melvin C. Chamberlin, of Johnsonsburgh, N. Y.: I claim the arrangement of circular, revolving or stationary brake wheel, A, with the ratchet wheel, B, and ratchet, C, the ratchet so operating the ratchet wheel when in use that the wheel, A, will change its position every time the brake arms, being acted upon by the pressure of the wagon on the horses, are reversed; wheel, A, being a stationary brake block, when the wagon is going down hill, but revolving with the wheel when the wagon is backed, substantially as set forth, and for the purposes described.

WATER GAGES FOR STEAM BOILERS—Edward Whiteley, of Boston, Mass.: I claim the arrangement of the elastic tube or packing around the glass tube, and the elastic disks or washers around the first, in the manner and for the purpose substantially as set forth.

I also claim the within described method of constructing and attaching the cage or guard which surrounds and protects the tube D.

HOSE CARRIAGE—John W. Wiler, Stephen B. Sturges and Gaylord McFall, of Mansfield, Ohio: We claim making the axle of the traveling wheels capable of revolving with the reel independently of the frame and wheels, so that cranks may be used on the ends of the common axle, for the purpose of more conveniently and efficiently winding up the hose, substantially as set forth.

GRATERS—Nathan Ames, of Saugus, Mass., (assignor to himself and Edmund Brown, of Lynn, Mass.): I claim using as described the periphery of the sector of a cylinder for a grater, in combination with the radial guides, D D, of the holder, E, whereby a curvilinear reciprocal motion is given to the substance to be grated, substantially as set forth, and for the objects specified.

CARDING MACHINES—Joseph Davis, of East Wilton, N. H., (assignor to himself and Royal Southwick, of Lowell, Mass.): In the wool picker, the waste wool after being raised by the rollers is immediately thrown out of the machine by the air blast of the picker cylinder; consequently I do not claim the application of a grate or grid under the main card cylinder.

Nor do I claim applying a series of rollers underneath the main toothed wheel of a wool picker.

But I claim the described combination and arrangement of a series of smooth surface rollers with the main card cylinder and its workers, or its workers and strippers, so as to operate therewith substantially in manner and for the purpose described, my invention having special reference to a carding machine.

BOMB SHELL—Samuel Driver, (assignor to himself, Isaac V. Cullin & Joel B. Sutherland,) of Philadelphia, Pa.: I claim a bomb consisting of an outer shell adapted for admitting and containing within it, besides the explosive and destructive materials, and fitted with a fusee, so that on the explosion of the outer or containing bomb, the fusee of the inner bombs shall be ignited thereby, and the bombs consequently exploded in consequence wherever they may chance to be thrown by the explosion of the larger or containing one, the said bomb being constructed substantially as set forth and described.

WATER INDICATORS FOR STEAM BOILERS—F. B. Fournier and David Hinman, (assignors to themselves and J. Munroe,) of Berea, Ohio: We claim the rod, N, and arms, N' and N", in combination with the pipe, J, and valve, L, when the same is arranged in relation to and operated by the lever, B, so as to signal high or low water by the whistle, K, substantially as set forth.

DETACHING HORSES FROM VEHICLES—W. D. Mayfield, of Bloomington, Ill., (assignor to himself and S. D. Porter, of Clarksville, Tenn.): I claim the swinging piece, s, with flanges, b, as described in combination with the plates, d d, and rods, f f, operating together, as and for the purposes set forth.

POLISHING THE HEADS OF TRUNK NAILS—Cornelius and Zachariah Walsh, (assignors to Cornelius Walsh,) of Newark, N. J.: We claim the rotating and vertically reciprocating cylinder, d, provided with the polishing substance, i, in combination with the intermittently rotating cylinder, N, provided with radial tubes, n, to receive and hold the nails, the above parts being arranged to operate as shown, for the purpose set forth.

We also claim the arrangement of the stop, T, relatively to the spout or tube, S, cylinder, N, and cams, G V, so that it shall be caused to rise at proper intervals, and thus feed the nails regularly out of the tube to the cylinder, N, substantially as described.

ADDITIONAL IMPROVEMENT.

STRAW CUTTERS—Loren J. Wicks, of Boston, Mass. Patented November 13, 1855: I claim the arms, K K, and adjustable cross piece, C, and hinged plate, S, or severally their equivalents, when vibrating or oscillating, in connection with the knife, substantially in the manner and for the purpose set forth.

I also claim the hinged or jointed knife bed, G, in combination with the arms, K K, and crank shaft, J, by which means the knife is made to reciprocate in a line

parallel with the arms, K K, for the purpose of preventing the edge of the knife from picking or scraping on the bed against which it cuts.

DESIGNS.

SHELF BRACKETS—Ira Chase, Jr., of Boston, Mass. Two patents.

CLOCK FRONTS—Nicholas Muller, of New York City. Two patents.

METAL KEGS—C. L. Rehn and H. Everett, of Philadelphia, Pa.

SIX-PLATE STOVES—N. P. Richardson and William W. Stevens, of Portland, Me.

STOVES—N. P. Richardson and William W. Stevens, of Portland, Me.

STOVES—G. Smith, H. Brown and J. A. Read, (assignors to L. McDowell & Co.) of Philadelphia, Pa.

COOKING STOVES—G. Smith, H. Brown and J. A. Read, (assignors to L. McDowell & Co.) of Philadelphia, Pa.

Californian Wines.

The United States seem to comprise within themselves every variety of material and production of the globe, and as our possessions are nearly one-eighth of the world, we are not surprised at the fact. But of all the States of the Union, California seems likely to be the most productive; her gold and other mines, her location on the Pacific coast, her hard-working population, and her natural advantages, all tend to make her the most important to the interests of the commonwealth. One of her last and newly developed capabilities is that of vine-growing and wine-making. We have received a communication on this subject from Mr. Charles Kolder, of San Francisco, a gentleman in the native wine business of that city, who generously accompanied his letter with samples of the native wine of his own production, which for flavor and quality seemed to us to be equal to many European brands, and only wanting in age. California is going to be a wine-growing country, and for the following reasons:—

"In the first place," says the *California Farmer*, "our vineyards produce ordinarily nearly three times as much as those of Europe and the transmontane States. In France, a first-rate crop from an acre is represented by 5,000 pounds of grapes, and in many districts 2,000 pounds is considered a fair crop; in Ohio, 8,000 pounds is a very large crop, and the ordinary amount is from 4,000 to 5,000 pounds. But in California, the ordinary crop is from 10,000 to 13,000 pounds, and 15,000 pounds per acre is not uncommon. Secondly, our grapes never fail as they frequently do in Europe and on the banks of the Ohio; nor do they ever produce so little as the largest crops which can be produced there. In other vine-growing countries the grapes are exposed to the attacks of frost, hail, the *oidium* (or rot in the wood), and insects, either of which often cause an entire failure of the crop; but they are unknown here. The *oidium* is a disease which first appeared in France about four years ago, and has caused such devastations that the wine crop since then has fallen off immensely, and about one-fourth of the vineyards have been rooted out and cultivated in other vegetables. In the third place, the vineyards of other countries require four or five times as much labor as those of California. Here the vine stands by itself; in almost every other vine-growing district, the vines must be tied to a stake for support. Indeed, the European vineyards require constant looking after and labor; while those of California, when once planted, require very little care, other than a couple of plowings in a year to keep them clear of weeds.

"Again, our land is cheap, vine-settings can be had for nothing; the growers are never troubled by rain; the warmth of the climate aids fermentation; and lastly, from one species of grape, and from one vineyard, the California vine-grower can make *five or six entirely different kinds of wine*, corresponding to most of the important kinds of European wine. Thus the Malaga grape, in the vineyards of Los Angelos, produces wine like the Sauterne, and claret, sherry, port and champagne; while in Europe each district produces only one kind of wine, and could not be made to produce so many as come from the California grape. Besides, our wines are good, and promise to be equal in every respect to the best from Europe.

"The brandy, also made from the grape, is equal to the best Cognac, except only in those qualities given by age, which our brandy has not yet got. It is remarked that the California wines have a peculiar flavor which is much prnised by judges."

Doubtless there must be some disadvantages which time and patience will have to overcome; but when we consider that, this year, the total produce will be about 14,000,000 pounds of grapes, and that from this quantity the city of Los Angelos alone will obtain 150,000 gallons of wine and 6,000 gallons of brandy, we cannot but think that California is destined to become the vineyard of the world!

On the subject of wine-drinking, we entertain the opinion that people are generally better off without it. The use of stimulating drinks of all kinds we cannot recommend; but if our people will use them, all must agree that we had better produce our supply on our own soil. It is a notorious fact that in wine-growing countries drunkenness is less common than in countries where the vine is not cultivated.

Lavender Farming.

There is one sight in Old England that I love beyond measure, and that is, a lavender field; it pleases from its intrinsic beauty. The lovely color of its flowers all the silk dyers are trying to match, but can't exactly hit on the shade. Then its fragrance! how inimitable, as the sprays wave with the breeze! It pleases me, simply because it cannot be matched in all the world, and I am proud of it accordingly. In England there are no less than about two hundred and seventy acres of its precious land devoted to lavender farming. Each acre yields, say, two thousand six hundred pounds of flowers. Every hundred pounds of flowers give up by distillation about one pound of the otto of lavender; and thus we learn that there is an average production of 7,000 pounds of lavender otto annually. It requires six ounces of this to make a gallon of lavender water, so that Britannia and her children—Jamaica, Canada, and Australia—together with a few visitors—America, Germany, and Russia—use and take home with them the enormous quantity of 17,000 gallons of this favorite spirit. The lavender farms of England are situated at Mitcham, in Surrey, and at Hitchin in Hertfordshire. At Mr. Perks' farm, of the latter place, the lavender, when in blossom, is resorted to by all the bees for miles around. The sound of their hum in such vast numbers is quite enchanting. Nor do the butterflies neglect to visit so luxurious a feast, the taste of which appears to be particularly grateful to them. The bees' love for the lavender is so excessive, that at the harvest time, as the sprays fall before the sickle and are tied up into sheaves, they will follow it, even at a sacrifice of life, into the boiling still!

SEPTIMUS PIESSE.

[We have no doubt that the growth of lavender would prove profitable in this country, and the above may call the attention of American farmers to it as an article of cultivation, and then we should not have to make a three-thousand-mile-voyage to see the welcome and pleasant sight of a lavender field; and in this, as in other things, we might with advantage imitate and, perhaps, excel that stout, well known old gentleman called John Bull.—ED.

Interesting Correspondence.

We extract the following from a letter from one of our western correspondents. As we suppress his name, he will, of course, take no offence. He says:—

"I have been reading your paper for two or three years with unrivaled interest, and wish to continue to do so as long as it remains under its present honorable supervision. I was sorry to have the paper stopped; but being dad's poor farmer-boy, and *only* thirty years of age, with a wife and two children, and dad being an old fogy, and having said that he would not give two cents for the SCIENTIFIC AMERICAN, how could I have the face to ask him for two dollars, or even *one* when it must come from his coffers; for I work all my time for him, and *darned hard at that*. I intend, however, to make a demand in the morning, very beseechingly."

We are happy to say that our friend succeeded in getting a dollar from his "dad."

The Grade and Horizontal Level.

As the citizens of all this region are abundantly aware, the greatest difficulty with which our farmers and planters have to contend is the constant "washing" to which their lands are subject from the moment they are put in cultivation. Scarcely a plantation in Hinds county, probably, is entirely exempt from this annoying and perplexing fault; and, certainly, we have seen immense fields so completely riddled with "washes" as to be abandoned as utterly worthless. In many instances, even the most careful and scientific management has failed to secure broad acres from this destruction—a destruction not unlike that which awaits the sandbar when its front is presented to the dashing floods of the great Father of Waters.

This natural characteristic of our genial soil is a source of immense injury and serious loss, throughout the upland region of Mississippi, to the State as well as to individuals, and numberless have been the experiments, and great the mechanical and scientific research, to discover a practical and certain remedy. We now have the pleasure to announce that an old citizen of Hinds county, Joseph Gray, an eminently practical and clear-headed man, has, after numberless experiments and thorough tests, invented an instrument of the above name, which is pronounced by those whose opinions on such subjects are entitled to the utmost consideration, the very thing which will put it in the power of every man not only to secure his land from the "washing" process, but also place it in such condition as to justify him in applying to it, when it may become somewhat exhausted, any of the fertilizers of the day, with the assurance that they will remain where they are placed, and hence amply repay him for his outlay and labor.

Mr. Gray has already made an application for a patent, and procured a beautiful drawing from Messrs. Munn & Co., of New York, which can be seen at the Post Office. The instrument may be regarded as one of the most important inventions of the day, and cannot fail to be well received by the public, as it has already met the decided approval of many experienced planters, as well as that of civil engineers and scientific men who have critically examined the drawing.—*Hinds County (Miss.) Gazette.*

Sand Bars and Dredging.

In our remarks on a letter published on page 402, Vol. 12, from a gentleman of Corpus Christi, on this subject, it seems that he thinks we have taken a wrong view of the facts, and he again writes to set us right. Speaking of the statement that the sand on the Texas coast does not sink more than twenty feet in the water, he says:—"It is well known that pure water does not increase in density according to the depth, sufficient to be of any use in the investigation; but sea water contains many impediments heavier than pure water, which are not held so perfectly in solution as to render the weight uniform at all depths, or even at the surface at all times after it has been agitated by a storm. Now this may, from its firmness or some constituent property, be so near the weight of the water at a certain depth, that the slightest motion would waft it to and fro until it found a resting place on a higher level than it would naturally sink to in a still water." He then states that "the coast survey of Texas has not found any sand below twenty-four feet either in or out of the bay." We are not sufficiently well acquainted with Texas and its peculiarities to corroborate this fact, but we know that what we stated before is true, namely, that if sand or any other solid matter commences sinking in water, it will continue to fall until it finds the bottom, although it may for a time be held in suspension by currents and the waves. For it must be remembered that however dense the water may be, it becomes dense equally in all directions, and so does not affect the sinking of a substance through it.

A Piece of Ingenuity.

We were shown, the other day, a remarkable piece of work, the result of much patience and perseverance. It consisted of a glass bottle, the hight of which was only one foot, and in which were constructed several reels of wood, having on them 3,437 beads, 120 yards of silk, and 8 china images; altogether this curious bottle contained 3,688 pieces, so jointed and framed that they filled the bottle, and had all been put together through the neck. But the crowning work was the stopper, from which four pieces projected in the form of a cross, so that it could not be withdrawn, and the question with us was, how was it got in? This bottle is the work of Mr. F. A. Fabvier, of this city, and is well worthy the attention of the connoisseur and curious. There are two on exhibition at the Crystal Palace.

Corn Husking Machine.

An improvement on the machine illustrated on page 217, Vol. XII., SCIENTIFIC AMERICAN, has been patented by the inventor, R. Bryson, of Schenectady, N. Y. This modification consists in cutting away the butts before they pass on to the husking rollers, and in employing toothed bars attached transversely to one of the endless aprons, so arranged that the ears of corn are allowed to drop away immediately after husking, and also in cutting the butts so that they can be used as fodder—all in the one machine.

Ore Washer.

Among the numerous appliances for cleaning ores, none has ever been found more perfect and economical than a simple basin, to which a peculiar motion (half rotating, half jigging,) is given by the hands of the operator. This new ore washer basin is the invention of J. Paull, of Clifton, Mich., and, by an arrangement of a universal joint and cranks, has imparted to it nearly the same motion, and so, it is hoped, may rival the hand-washers.

Polishing Trunk Nails.

All those kinds of nails which require to have polished heads may be treated in this machine. The nails drop in little conical recesses in a cylinder; their heads only being exposed, and this cylinder rotates under a polisher, which revolves at right angles to it, and by a progressive movement it comes in contact with every nail. It is also self-feeding, and is the invention of C. & Z. Walsh, of Newark, N. J.

Feeder for Cotton Gins.

By the employment of an endless band, in connection with a revolving comb and a fan, the inventor (J. Prescott, of Rockford, Ill.,) is not only enabled to dispense with the services of a feeder, and to feed with more regularity and certainty than if done by hand, but also to clean the cotton of all dust and dirt before entering the hopper of the gin.

Street Scraper.

This machine is an accompaniment to the one illustrated on page 225, Vol. XI., SCIENTIFIC AMERICAN, and is designed to remove the greater amount of dirt that may be scraped up into heaps or lines, so that the further cleaning may be done either by hand or by a sweeping machine. It is the invention of M.W. St. John & I. Brown, of Leonardsville, N. Y.

Bending Machine.

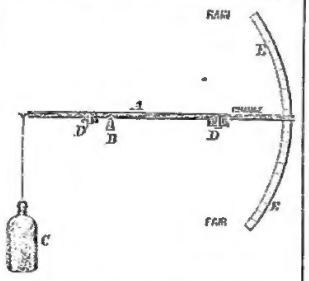
A new machine for bending wood for the felloes of wheels, and other similar purposes, has been invented by C. F. Beverly, of Lancaster, O., which machine bends wood from the center by means of pressure exerted by radial arms pressing it tightly against the periphery of the mold.

New Inventions.

Cheap Barometer.

On page 11 of the present volume we published a description of this useful piece of apparatus, and as we have had many questions asked us concerning its construction, we now publish an engraving of it, and again briefly describe it.

A is a lever, made of light wood, balanced on the fulcrum, B, and carrying at one end a closed tin can or bottle, C, the weight of which is balanced by adjusting the weights, D D; and E E is a curved paper or other scale. To use it, choose one of those days when the sky looks blackish, as if it did not know whether to rain or not—when you occasionally see a



small blue patch in the heavens, and then down comes a small, smart shower—when for a moment you feel quite hot in the sun, and then he hides himself, and you are sorry that you did not bring out an overcoat—in fact, choose a changeable day. Adjust the barometer then as the engraving shows it, and place it where it will not be affected by the winds, and you will have a good and cheap indicator of the weather.

Improved Feeding Apparatus for Saw Mills.

This invention is an improvement in the ordinary feed motion employed, where reciprocating saws are used, by which the motion of the carriage may be readily reversed, and the necessary "gigging back" movement obtained in a very quick and most simple manner—the feeding device being connected with cone pulleys, and by these the speed may be regulated to a nicety. Our engravings represent this device.

Fig. 1 is a perspective view of the whole apparatus, and Fig. 2 a side view of the improvement. The same letters refer to similar parts in each.

A represents the frame, in the lower part of which is placed a shaft, B, having a crank pulley, C, at one end, from which a pitman, D, drives the saw, E. On the shaft, B, is placed a cone, F, and another cone, G′, is placed on the shaft, G. The two cones, F G′, are placed in reverse positions, and a cross belt, H, passes across them. I is a belt shifter, placed on the screw shaft, J, by turning which the belt may be adjusted in any position required. On one end of the shaft, G, a pinion is secured, which fits into the toothed wheel, K, placed on the end of a shaft, L; this shaft has its bearings attached to the outer ends of the brackets, M,—only one being seen in our engravings. The bearings of G are also secured on brackets.

The end of the shaft, L, opposite to that on which it gears with K, is hinged to its bracket, *b*, and on this end is secured a pinion, N, gearing into the toothed wheel, O, which is placed on one end of the shaft, P, the bearings of which are on the uprights, *d*, rising from M. On the shaft, P, are also secured pinions, Q, which gear into the racks of the carriage, *m m*. To the hinged bearings, *b*, a rod, *e*, is attached, which has a bend in it, which, when placed on the bar, *g*, retains the pinion, N, in gear with O.

On one end of the shaft, G, there is placed loosely a collar, with the wheel, S, attached, and this wheel, S, also gears into O. To the inner side of this collar is attached a conical hub or box, T, which fits into the larger end of the cone, G′; a spiral spring being placed between it and G′, and having a tendency to keep T free from G′. On the other end of the shaft, G, is a lever, kept in position and pressing against it by the rod, *j*.

The operation is as follows:—When the hub, T, is thrown out from the cone, G′, the shaft, P, will be rotated from the cone, G′, by means of the wheel, K, pinion, N, and wheel, O, the pinion, N, of course, being in gear with O. The arrow indicates the direction of the motion of O. When it is desired to "gig back" the saw, the pinion, N, is thrown out of gear with the wheel, O, by removing the rod, *e*, from the bar, *g*, and the operator draws or pulls the rod, *j*, and causes the larger end of the cone, G′, to bind tight on the hub, T, to rotate the wheel, O, by means of the pinion,

LUND'S FEEDING APPARATUS FOR SAW MILLS.

Fig. 1

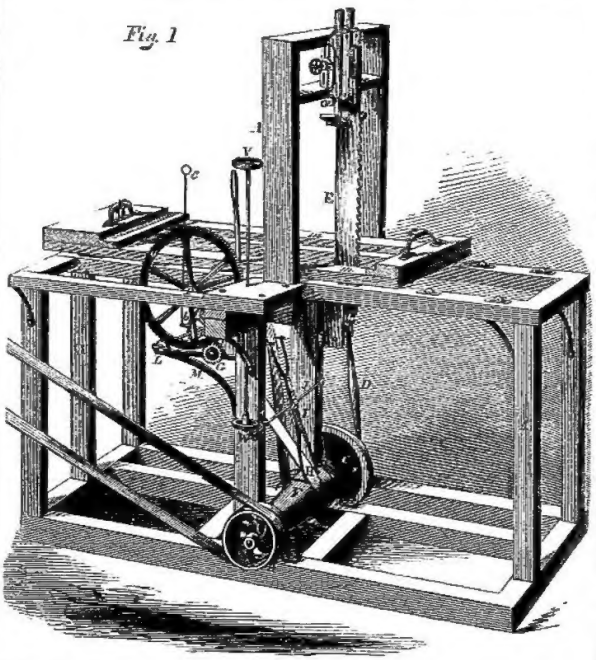
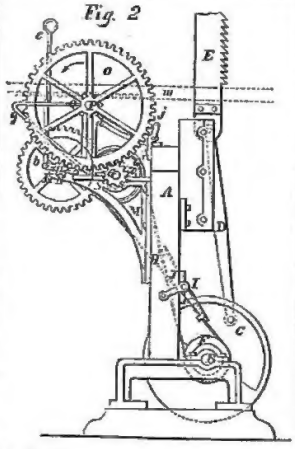


Fig. 2



S. By this means a quick "gigging back" motion is obtained; the operator, of course, retaining his hold on the rod, *j*, until the motion is to be reversed, which is done by releasing the rod, *j*, and throwing N, in gear with O. The speed of both movements may be increased or diminished by adjusting the belt, H, (by means of the shaft, V, and bevel wheels, W,) on the cones, F G′.

This device is extremely simple, and may be applied to saw mills at a moderate expense. A machine exhibiting this invention is on view at the Crystal Palace. It was patented September 1, 1857.

Further particulars and information may be obtained of the inventor, George D. Lund, of Yonkers, N. Y., or from William Montgomery, 229 Broadway, this city.

Collender's Socket for Bolts.

This invention is one of great utility, and one whose practical application will be at once appreciated. It is a common complaint among housekeepers that the socket of the

Fig. 1

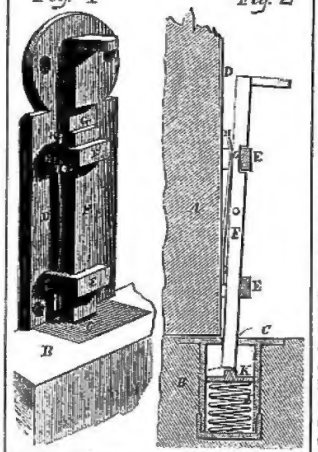


Fig. 2

shutter-window or other bolt is full of sand or dust, and the cold night air or perchance rain-drops from the storm have to be admitted while, with the point of an old knife, this is being removed. By the employment of this simple socket all this may be avoided, and the bolt at any time pushed into the socket with ease. In our engraving, Fig. 1 is a perspective view, and Fig. 2 a section of this arrangement; the letters refer to similar parts in both figures.

A is the frame, shutter, or other piece to which the bolt is attached; B the frame in which the socket is placed, and E the slides in which the bolt, F, moves up and down. The bolt is furnished with a groove, G, and behind it is a spring, H, which tends to press the bolt forward, and when the bolt is down (as seen in Fig. 2), this groove fits on to the slide, and keeps it locked, and it can only be lifted up by pressing it back; this prevents the bolt shaking, and renders it more desirable than the ordinary ones. C is the top of the socket let in flush with the frame. I is the socket case containing the spring, J, which, when the bolt is out, presses up the plate or follower, K, having on it a raised piece which is just the size of the bolt, and closes the aperture firmly, keeping the socket quite clean. This is the whole arrangement, and has, at least, the merit of extreme simplicity. It was patented Sept. 15, 1857.

For further information and particulars, apply to the inventor and patentee, H. W. Collender, 53 Ann street, New York.

An Old Idea.

In Paris, on the pleasant Sunday afternoons of August and September, many a blueb-loused *ouvrier* or *atelier* may be seen flying along with the speed of the living horse, although he is only mounted on a "dandy horse"—a pole suspended between two wheels, having a small saddle on it, across which the rider sits, and propels himself by alternately pressing the ground with one foot, and then the other. Give but the French or Belgian laborer his "dandy horse," and for a time, at least, he is happy. At one time it was common to see these velocipedes traversing our streets; and considering the small amount of labor which the Parisian expends to move along so rapidly, we have thought, how is it that every one does not mount a "dandy horse," and each individual keep his own velocipide?

About twenty-five years ago, a rage or excitement was got up in England, and every one of liberal ideas was expecting that soon steam would draw them along common roads. Engines or locomotives of various forms and arrangements were constructed, and what is more remarkable, the majority were successful; so much so that steam omnibuses ran daily in London, and were always loaded with passengers. But not one is now to be seen in that great city. The resistance offered upon our common roads to the action of the machinery of a steam carriage is too great to be successfully overcome in an economical point of view. They are not economical, and will never be generally used. This is but introductory to the following account of a steam carriage manufactured by Messrs. Dudgeon & Lyon, of this city, on which we had a ride the other day, and which has created some sensation here, and tended to revive the old idea of steam applied to common roads. It is about 2½ horse power, with a 3-inch cylinder, and 18 inches stroke—the only peculiarity in this engine being the length of stroke, and comparative smallness of the driving wheels. The simple fact is that a team will, from its cheapness, always be able to compete with steam where the loads are not large, and the roads not constructed purposely for it; and whenever there is business enough, a railroad can be constructed, with comparatively less expense. We cannot say much for the engine itself, as there is so little novel about it; and we would advise its designers in future to turn their attention to something new, and likely to be of more practical benefit to the community at large, and to give up following old ideas.

Perseverance against Difficulties.

On the 7th of July, 1848, the work of draining the Harlaem Lake, in Holland, was commenced, and on the 1st of August, 1852, the official gazette announced that the bed of the lake was dry. At the beginning of the present year, 42,500 acres of good land were under cultivation on the site of the lake, divided into 2,518 farms, and 157 dwellings, 731 barns, and other buildings had been erected. The population is 5,157.

Scientific American.

NEW YORK, OCTOBER 24, 1857.

The Infusoria, or the Minutest Forms of Life.

Professor Ehrenberg, of Germany, was the first who called special attention to these, the lowest forms of animal life, and they are interesting, as being the simplest forms of matter in which life is seen to exist. Nearly all of them are microscopic, and some are so small that it would take billions of them to make one cubic inch, and yet the minutest of God's creatures are as perfect in their sphere as his highest creation, man! Let us describe the general appearance and habits of these wonderful little beings as they have been made out by the labors of many a patient microscopist. They are all sorts of shapes, some square, some oblong, some round, and are formed of a colorless, transparent jelly-like matter, provided all over their bodies with myrinds of small arms or hair-like projections, which are called *cilia*, and it is by moving these that they are enabled to propel themselves through the water, or up and down at will. It is an interesting and profitable sight to see within the limits of a few drops of water, numbers of these animalcule, moving their cilia with a rapidity the eye can scarcely trace, and to find them swimming first in this direction, then in that, wherever there is food, and at the same time demonstrating that they possess a will as strong in proportion, if not stronger than our own. Indeed, there is no giving up with them, for we have seen two rush at the same bit of matter, and instead of either giving it up, the largest would absorb the smaller and the food as well, and then go on swimming away as if nothing had happened. It must be explained that they have no mouth, or indeed any special organs, but when they come in contact with any substance suitable for their food, they instantly, as it were, wrap themselves around it and it becomes absorbed by the general mass of their bodies. Their anatomy is simple, being nothing more than a number of little transparent cells collected around a central nucleus, and having a number of cilia on the outside. Among these cells is discovered what may be considered to be the first index of a circulatory system, as there is a motion of the fluid which seemingly cements them together. There are also indications of a respiratory system, which is on the outside or skin, although they cannot actually be said to possess a true skin, it being only the outside of their jelly-like bodies. Touch seems the only sense which they have, and in this respect they are only equal to many plants, and many of them are only to be distinguished from the lower species of vegetable life by their possessing the power of free locomotion, or being able to move from place to place at will, while others are gifted with some slight instinct, for they have a harder back and characteristic shape, and a few that have not hard backs naturally, make them for themselves of fine sand. They multiply and propagate in a very simple way; there are no sexes, but when a fresh one is wanted, some old or middle aged infusorial gentleman or individual stops its cilia a moment and splits itself in two, when instantly each turns out on its own account to seek its hourly food, and is to all intents and purposes a perfect infusorian. Notwithstanding that these are such mites of beings, physiologists have given them quite a dignity in our eyes, from the long names by which their *genera* and species are known, as for example "Paramœcium kolpoda," "Stylonychia mytilus," and others. Who would think that animals with such fine names were not visible to the naked eye, and could only be observed by the aid of a powerful microscope? They belong to the group of the animal creation called "Protozoa," or the first forms of life, and are an interesting, wonderful and beautiful portion of that class of created things that we call living beings.

Human Endurance.

Not a day passes over our heads on its way to burial in the mighty cemetery of the past—not an hour or moment flits by us with the swiftness of an arrow hurrying to its appointed mark—but what brings with it some instances of human genius, courage, perseverance or endurance. We are rather apt to look upon ourselves as frail creatures; and many of us "fear to fly, lest we should fall," having no confidence in our own strength of mind and bodies; and, as a natural consequence, none of us do all we might in the sphere by which we are surrounded. As a kind of counteracting influence, we occasionally see and hear of instances of endurance, hope, and perseverance, which at first we are inclined to regard as supernatural; and one of the most striking instances of this kind lately happened.

John Tice, first assistant engineer, Andrew Grant, fireman, and G. W. Dawson, passenger on board the unfortunate steamship *General America*, were brought into this port, a short time since, by the bark *Laura*, which had taken them off the brig *Mary* on the 28th ult., (lat. 40° 45', lon. 71°,) the brig having picked them up at sea. They had been nearly *nine* days without food or water, and were still alive; they had been subjected to the tempestuous tossings of the rude ocean, supported on pieces of wood, and then in a frail boat. More than three hundred of their fellow passengers had perished, and they still lived!

Men and women have been buried in mines, have been overwhelmed with glaciers; have suffered shipwreck; have lost themselves in desert places; have suffered all kinds of perils without food or water, and been rescued after two or three days, and their escape has been considered remarkable. But here three men are now alive, with every prospect of returning health, after unheard-of sufferings, and they may be regarded as having demonstrated the powers of human endurance under trials and adversities in a more extraordinary degree than any other instance of modern times.

No Sugar from Chinese Cane.

We are becoming tired of the interminable *Sorgho* speculation, and are beginning to think that the plant will not amount to much after all the fuss that has been made about it. In a recent conversation with an eminent sugar refiner in this city, he gave it as his opinion that *dry sugar* cannot, under any circumstances, be obtained from the China cane, more especially if it be raised in a northern climate. This confirms the opinion of Dr. Hayes, published in No. 52, Vol. XII., of the Scientific American. As a general thing, the plant will not mature, or, in other words, it will not ripen so as to perfect the changes which the sap must necessarily go through in order to yield sugar.

The presence of a sweet taste does not necessarily indicate sugar. Honey, by the curious practical chemistry of the bee, can be made from starch, potatoes, *old rags*, &c.; in fact, by the action of acids, any substance that has starch in its composition can be made to yield a sweet, but such sweet will not granulate; and no doubt we shall continue to hear frequent complaints that the Chinese cane will produce nothing except a syrup.

Sugar is an active principle, just as morphine, quinine, &c., are active principles of opium and Peruvian bark; and as the juice of the poppy will not yield morphine unless well ripened, so also the common cane will not yield sugar unless it is thoroughly ripe. The common New Orleans sugar does not yield as much *dry* sugar as the Cuban, by reason of the fact that the former is more frequently made of green cane. The process of making New Orleans sugar is the same as all others, namely, by simple crystallization, and the more slowly it is carried on, the greater is the resulting product.

Our readers who may desire to obtain a more minute knowledge of the Chinese and African cane plants, will do well to procure Olcott's treatise upon their origin, varieties and culture. Published by A. O. Moore, 140 Fulton street, New York.

Bank Suspensions.—Money Easier.—Times Better.

There is a natural feeling in all men's breasts, that it is always best to know the worst. During the past few weeks the whole commercial community seemed sinking into some unknown abyss of stagnation, and the working classes appeared hurrying to starvation. A universal horror seized the public mind, little business of any kind was transacted, property of every sort depreciated in value, and specie to meet immediate demands was quickly swallowed up, without there being much hope of a fresh supply; banks refused to discount, and nothing but gloomy looks and despairing expressions were to be seen or heard from Wall street to Fifth avenue. Owing to the continual demand for specie upon our city banks during this period, their vaults were impoverished; nearly every one of them experienced what is called a "run;" and on Tuesday, the 13th, all of them, (with one exception, the Chemical Bank,) and nearly every country bank within five hundred miles of New York, suspended specie payments. This brought the crisis to a head, every one knew the worst, and the commercial world felt comparatively at ease again.

Little inconvenience has been felt from the general suspension; the banks continue business as usual, except that they make no payments in coin; they receive bills of other banks on deposit, and men go in and out of them with their usual elastic step. Business is again becoming brisk; and as we seem to have once more started on our old system of "business confidence," and money is becoming much easier, we think we may safely believe, without being too sanguine, that our former prosperous position will be recovered by the New Year, and that we shall have a Spring trade of the usual activity. As an illustration of the improvement of the last few days, many stocks and securities (bank, State, and others) have risen ten per cent, and some even more than that; but we do not wish to overstate the relief that is felt on all sides. There is, however, little doubt that the Fall trade is ruined, and many merchants will have their goods on hand instead of in the market. As a kind of set-off to this, some of the larger dry-goods' merchants, who were entirely wholesale in their transactions, are now offering to sell all their goods at retail, rather than have them remain on their hands.

We earnestly hope that we may be able, each week, to chronicle a progressive improvement; and we conclude by illustrating our recent pecuniary embarrassment by the similitude of an old fable:—The great wheel of our national prosperity has been in so deep a hole that we were nearly overturned; but we put our willing hearts and stronger heads and hands to it, gave "a long pull, a strong pull, and a pull altogether," and we are now again traveling the road to national wealth and greatness, having shown ourselves, throughout this ordeal, as we have throughout many others, to be a living example of the motto:—"Union is strength."

Inventions Examined.—Rejected Cases.

If an inventor has made an improvement which he desires to get patented, his best course is to send a sketch and description of it to a responsible agent, and get his opinion in regard to its novelty. In connection with our office in New York we have a Branch at Washington, through which we are conducting examinations at the United States Patent Office, and are attending to rejected cases of our own, as well as those prepared by other patent agents. We are determined that no case committed to our care shall remain rejected for want of vigorous prosecution. Examinations are conducted and reported upon for a fee of $5, on receipt of the necessary sketch and description. Circulars of advice upon patent business sent free.

Never Go the Whole Hog.

"A fat hog is the very quintessence of scrofula and carbonic acid gas, and he who eats it must not expect thereby to build up a sound physical organism. While it contributes heat, there is not the twentieth part of its nitrogen the base of muscle."

An exchange gives us this paragraph, which we cordially endorse as being sound practical truth. Fat pork was never designed for human food. It is material for breath, and nothing more—see Liebig, and other organic chemists and physiologists; it makes no red meat or muscle. The prize-fighter is not allowed to eat it; all that is not consumed by the lungs, remains to clog the body with fat.

Guinea Fowls vs. Rats.

A correspondent of the *Prairie Farmer*, who was much annoyed by rats, tried shooting, poisoning, and everything he could think of, but they defied category. He then heard that they would not remain where guinea fowls were kept, and procured several, and now says that for years he has neither seen nor heard a rat about his premises.

We remember when we were a boy that our fathers used to keep guinea fowls, and we also remember that there was a large detachment of rats in the old barn, which would not be frightened away, especially about harvest-time, by the screeching of those fowls.

Artificial Fire Clay.

Common clay is very fusible; this is owing to the presence of lime, iron and magnesia in it. By removing these substances, it can be employed for making very refractory vessels, such as crucibles, to withstand a very high degree of heat. The way to do this, is to steep the clay for some hours, (from six to twenty-four, in dilute muriatic acid, according to the quantity of these substances in it,) then washing it with water, and drying it afterwards. The muriatic acid takes up and dissolves the substances named, which are removed with the washing.

Telegraphic Improvements.

Edward Highton, C. E., of England, has just obtained a patent for, firstly, sending telegraphic messages *both* ways through one and the same wire, at the same instant, without interfering in any way with each other; secondly, for preventing the destruction of a wire in the sea or underground; and, thirdly, for mending a decayed telegraphic wire in the ocean without raising it out of the mud.

Dr. Drake, the inventor of the "explosive engine" which attracted so much attention at the Fair of the American Institute last Fall, died very suddenly at Saratoga, N. Y., on the 11th inst.

The Twenty-ninth Annual Fair of the American Institute.

FIFTH WEEK.

Despite the financial crisis, and the acknowledged hardness of the times, we are happy to say that the Fair has not suffered in any way. Indeed, on the 13th inst., when fifty banks in this city suspended specie payments, and men with anxious looks and hurried words were discussing the great calamity, that evening the Palace was more crowded than we had ever seen it. Its success this year has seemed to us more like an ancient "royal progress" than a modern exhibition. Hoping it may keep on in the good way, we proceed to examine the

STEAM ENGINES.

Considerable interest usually concentrates on the steam engines, but this is hightened this year by the offer of a premium for the best performance; and it is understood that the engines are to be carefully tested. This, we think, has never before been attempted at any fair, either in this country or Europe, the points to be considered being economy in cost of the machinery, regularity of the performance, and economy in running expenses. Three engines have been entered for competition, all horizontal stationaries of about equal size. The first is a beautifully finished piece of work by Messrs. Bunce & Brothers, of this city. The second (in the order in which it was entered) is by Messrs. Hinckley & Egery, of Bangor, Me., and carries conspicuously on its side the motto of the State of Maine. The third engine—now just connected to the shafting to aid in driving the machinery of the exhibition—is by the Corliss Engine Co., late Messrs. Corliss & Nightingale, of Providence, R. I.

Praises of the steam engine have become hackneyed. We all know that its influence is immeasurable, and still increasing; that it is the great civilizer, the benefactor, the enlightener of mankind. We all know that the Grecian mythology made fire the greatest blessing which the gods had ever conferred on man, and that the steam engine is among its most marvelous and unlooked for results. But all do not know, or will not be made to feel, the great difference existing in the degree of economy of the engines in use. Even those manufactured by the same builders, and in precisely similar styles, frequently differ by a sensible percentage in the economy of their performance; and in many instances, engines and boilers of so different characters are working in the same block, that one establishment will consume two or even three times as much fuel in proportion to the power developed as the other. We are glad to observe that the subject has attracted the attention of the managers of the present Fair; and we hope that the observations will be made in that thorough manner which is necessary to render the results in some degree reliable, as a guide to parties intending to purchase.

A volume of the *Railroad Journal*, published in 1833, sets forth, with a considerable air of exultation, the fact that sixty stationary steam engines of various kinds and sizes were then in operation within the limits of this city. Now the number has increased to about half as many hundreds. To say nothing of the steamers, of which official statistics inform us 673,000 tuns existed, either as enrolled or licensed vessels, within the inspection districts of the United States on June 30, 1856, or of the 9,000 locomotives now standing in the shops or running on the rails of our immensely extended railroads, the aggregate consumption of fuel for stationary steam engines alone entitles the subject to a high rank in commercial importance.

Of the three competing engines in the present Fair, the first appears to be only a very fine specimen of the ordinary slide valve engine, having a cut-off valve riding on the back of the common valve. The point of cut-off is fixed at about half stroke, and the motion is governed by a throttle valve, in the ordinary manner. But both the others are examples of what we consider a very important step in the development of steam power—the regulation by the cut-off.

Messrs. Hinckley & Egery's engine is of nearly the ordinary appearance, externally, but has a cut-off invented by George E. Reynolds, of Medford, Mass., the present superintendent of machinery in the Fair. This cut-off was patented in February last, and possesses some admirable features. There is a long slide valve, worked uniformly by a single fixed eccentric, and carrying on its back two balance puppet valves, which control the admission of steam to the respective ports. These valves are raised by peculiar wedges carried on the main slide, the thick ends of which meet the ends of the steam-chest as the slide approaches the termination of its throw. Each wedge is driven back—and the corresponding valve is lowered—by the contact of the small end with a stop, which is connected to the governor through the aid of a very slender steel rod, which passes through a stuffing-box. The governor is mounted immediately over the steam-chest; and when the balls rise, the two stops (which are simply bent levers) are extended, and meet their respective wedges, and release the valves at a very early period in the stroke. The action is very sensitive, and is capable of cutting off at points varying from the commencement to very nearly half-stroke. The wedges are not, as might be supposed, tapered uniformly, but are shaped so as to hold the valve on a parallel portion, and lower it very rapidly when moved to a proper extent.

The third, the Corliss Co.'s engine, is in the style peculiar to these manufacturers, and possesses all the novel features which have made the "Corliss engine" a marvel of economy and perfect regulation. On a trial, a few days since, in running down the steam in the boilers, this engine continued to revolve until the pressure was only about ⅛ of a pound; but this simply proves the friction to be slight, and the valve openings to be very free. In this style of engine a separate valve is employed at each end, both for the induction and eduction (four valves in all); but the whole are worked from one rock-shaft, or "wrist-plate." The steam valves are each unhooked at any point from the commencement up to half-stroke, and closed very quietly and rapidly by the aid of a weight—the momentum of the weight being destroyed at the close of its motion by its cushioning a quantity of air in the cylinder beneath it. Several ends of great importance in steam engineering (aside from the cut-off regulation) are secured by the "Corliss engine," among which are the very rapid and wide opening of the valves, the rapid closing of the steam valves, and a somewhat extraordinary degree of perfection in the workmanship. T. D. Stetson, Mech. Eng., this city, who examined with great care the operation of one of these engines in a large cotton mill, in September, 1856, reported the consumption of coal to be only 1·9 lbs. for each horse-power, per hour. But this performance is, probably, no better than that of several other engines from the same patterns working in other mills. The fuel required with good ordinary engines is from 3 to 6 lbs. per horse, per hour, showing a gain of from 50 to 200 per cent in favor of the new style.

The three competing engines are nearly the same in size. The cylinder of the first is 15 inches in diameter and 3 feet stroke; both the others are 12 inches by 3 feet—the size prescribed by the managers of the Fair. They will be tested by the indicator, by the dynamometer, and also by driving, with a given speed, a certain number of fan-blowers, for several days together; these being assumed to be machines which make a *cheap* and perfectly uniform resistance. The performance will be varied with each at carefully noted periods, so as to allow the cut-off to vary very greatly. We shall publish an abstract of the results so soon as it can be procured.

Omitting the steam pumps, there are seven engines which are too small to compete for pre-eminence in economy. They are mainly of those sizes and classes which do not claim attention, except for compactness, portability, &c. Two are "Reed's Patent Oscillators," a convenient, strong and portable engine, adapted for farm purposes, and manufactured by Messrs. Reed & Birkbeck, of Jersey City, N. J. The steam is admitted and exhausted through the trunnions by the movement of the cylinder itself; but in one example, there is a separate cut-off valve, worked by the aid of an arm extending from the cylinder.

"Craig's Patent Double-Acting Balance Valve" controls the action of steam in a small oscillator, exhibited by Messrs. Canfield & Lidgerwood, of Morristown, N. J.

Two of "Willmot's Patent Engines" are exhibited, in connection with sawing machinery, by the Forest & Agricultural Steam Engine Works, of Brooklyn, N. Y. The cylinder of each of these is long and light, and is hinged to the frame at one end, so as to be free to oscillate, or rather, to vibrate, at will. The piston rod of one is, in fact, attached directly to a stout saw, and as the whole is readily moved, and is fixed by a simple movement to either standing or fallen timber, it is intended to be of great service in both "cutting down" and "cutting up" trees.

The two other engines are by Mr. Blanchard, of Waterville, Me., and have not yet been made ready for continuous use. They are combined together, one (the smaller) being intended to use the steam at a high pressure, and discharge it into the other, with some peculiarities in the use of the products of combustion, which we have not yet fully examined.

L. Wright, of Newark, N. J., the patentee of Wright's admirable scroll saw, shows its powers by producing various difficult pieces of fancy sawing, such as toy chairs, etc. By its side, the same exhibitor has in operation a piece of mechanism which is justly admired as one of the finest things in its line extant. This is A. D. Waymouth's "Patent Spool and Box Machine"—a species of lathe which seizes the end of the wood in a tapering screw chuck, and throws out the finished articles with a rapidity almost exceeding belief. It shapes the outside by a tool fixed in a slide rest, a portion of which tool embraces and guides the stick; it simultaneously shapes the inside by a tool also carried in a carriage on the ways; and it cuts off the box or spool by the action of the foot of the operator. This style of machine is capable of producing hubs, and there are one or two already in operation on work of that character.

A "Blind Slat Tenoner," patented in February last, by S. C. Ellis, of Albany, N. Y., must close our notices for this week. In this machine the slats are inserted edgewise in a deep groove in the side of a suitable long cylinder, or, rather, in a series of small wheels mounted on one shaft, and the whole is then revolved so as to present every side of the projecting ends to the action of rapidly rotating cutters. The cutters employed in practice are simply circular saws, mounted side by side. The stands in which they are supported may be placed at any required distances apart, so as to produce slats of all ordinary lengths. As many as forty-eight slats have been tenoned with tolerable perfection—the cutting-off of the ends being, of course, performed at the same operation—in the course of one minute.

CORRECTION.—In our reports of the Fair in No. 5 of the present volume, we stated that the Atmospheric Hammer exhibited by Milo Peck had been illustrated on page 137, Vol. XI., of the SCIENTIFIC AMERICAN. We have now to correct that statement, as it is not the Atmospheric Hammer, which is entirely new, but a Drop Press, that will be found on that page.

Grain for Europe.

It is reported, upon good authority, that eighteen ships are now loading at the wharves in this city with grain for Liverpool, and will carry out one million one hundred thousand bushels in bulk and bags. Every vessel is allowed to take an amount of grain in bulk equal to one-half her registered tunnage; and what she may take in addition, in bags, is left to the option of the Inspector. Since these and other wholesome regulations have been enforced, no losses have been occasioned by the overloading of ships, nor have vessels had occasion to put back in a leaky condition, with pumps choked, cargo damaged, &c.

A gentleman just arrived from Chicago informs us that there are in store at that place 25,000,000 bushels of grain, but that not more than 1,000,000 bushels will come forward previous to the closing of the canal, for want of money to send it on.

HOSPITAL FOR FELINES.—Bayard Taylor, in his *New Volume of Travels*, gives the following description of the cats of Aleppo:—"The other remarkable thing here is the hospital for cats. This was founded long ago by a rich cat-loving Mussulman, and is one of the best endowed institutions in that city. An old mosque is appropriated to that purpose, under the charge of several directors, and here sick cats are nursed, homeless cats find shelter, and decrepit cats gracefully purr away their declining years. The whole category embraces several hundreds; and it is quite a sight to behold the corridors and terraces of the mosque swarming with them." It is calculated that there are at least 8,000 cats in the above city.

PEPPER is an almost universal condiment. Black pepper irritates and inflames the coatings of the stomach; red pepper excites, but does not irritate, consequently it should be used instead of black pepper. It was known to the Romans, and has been in use in the East Indies from time immemorial, as it corrects that flatulence which attends the large use of vegetable food. Persons in health do not need any pepper in their food; but to those of weak and languid stomachs, it is manifold more healthful to use cayenne pepper at meals than any form of wine, brandy or beer that can be named, because it stimulates without the reaction of sleepiness or debility.

THE ATLANTIC CABLE, it is reported, is not likely to prove available for either of the projected Indian lines of telegraph. It appears that in its present coiled state, it generates or absorbs a great amount of heat, and a fear is entertained of its being ruined by the temperature to which it would be subjected in twice crossing the tropics. It has been found that extreme heat in the parts under pressure forces the copper wire to the sides of the gutta percha, and destroys insulation.

PROGRESS OF STEAM.—It is said the number of locomotives running in the United States at the present time is estimated to exceed 9,000. The proportion of engines to length of road will average one to every three miles; for, while some of the Western roads have but one to every five or six miles, many others, like the Erie, New York Central, Baltimore and Ohio, &c., have one for nearly every two miles.

COPPER.—One of the masses of copper from the Minnesota Mine weighs 8,742 lbs., and is the largest ever yet produced in the Lake Superior country. The Minnesota Mine has shipped one mass this season, weighing nearly 9,000 lbs., and the Cliff Mine has shipped a lump weighing 8,500 lbs.; but this last one from the Minnesota Mine beats them all.

NEURALGIA.—A new remedy for neuralgia has been for some time prescribed with success by a physician of one of the British hospitals, in the cases of patients suffering from that very painful affection under his care. The remedy used in the valerianate of ammonia—a new chemical compound.

MARINE LOSSES.—During the month of September last, the losses at sea amounted to over $3,000,000, being, with one exception, the most disastrous month of the year. The summary of losses, for nine months past, reaches the enormous sum of $14,758,300.

Correspondents

R. W., of N. Y.—The "magic lantern" notice was not intended for you. Did you not receive an answer to your inquiry on this subject? Your remarks in regard to the barometer are correct, and you will find an engraving of it in another column.

S. P., of R. I.—Probably the best work on Photography is Robert Hunt's, which, we presume, you can find at the principal bookstores here.

D. W. C. B., of Wis.—You had better write to Mr. Ustick in regard to his brick press. We cannot give the information you seek in reference to his machine. Many inventors wisely seek our columns to make known to the public the peculiarities of their inventions. Mr. Ustick will probably do so in due time.

E. S. B., of N. Y.—The sensitiveness of the so-called sensitive plant, or mimosa, has no connection with electricity beyond that which exists between all natural objects and the forces of nature, but is due entirely to a kind of mechanical muscular action.

John F. Dawson, Tuskegee, Ala., wishes to know if there is a rice mill on a cheap plan that is worth purchasing? Such a mill is wanted.

C. G., of Me., and others.—It is not new to use granulated cork in making life-preserving mattresses. It has been practiced more or less for twenty years. See patent of Stephen Bates, Dec., 1832.

O. D. B., of Ohio.—Two years since there was considerable attention paid to substitutes for rags in the manufacture of paper. It was proposed by several to use corn husks, but no success has attended the suggestion.

H. E., of Ill.—To enable us to judge of the patentability of your ink, we must have a full description of the mode of its manufacture, and the ingredients of which it is composed.

E. D. R., of Pa.—"The History of Reaping Machines" we have not published in pamphlet form, and do not intend to do so.

J. D. C., of Pa.—We cannot give the information you wish in reference to the location of land warrants, or as to the best method of arranging for the payment of the taxes.

D. A. F., of Pa.—The suggestions contained in your letter in regard to the Atlantic cable are not new.

C. A., of Pa.—In reply to the inquiry you made three weeks ago, we would state that P. Noette, 227 Front street, Brooklyn, can furnish you improved machinery for making hooks and eyes.

D. B. C., of Pa.—You are a sensible man. You will not only get a full equivalent for your remittance, but in exchange for your suspended bank bills, you will no doubt receive a premium in gold on the the 1st of January for a larger amount than your paper money represents at par.

S. M., of Mo.—Your communication on the "Motion of Comets" is much too abstract for our journal, and we do not know of any that would be likely to accept it, as we are afraid the abstract scientific ones are jealous of any innovation on the acknowledged principles of astronomical science.

O. C. F., of Ohio.—There is no special machine in use for grinding and polishing concave specula; nearly every manufacturer uses a different form. Sheet zinc can best be amalgamated by first cleaning the surface with weak vitriol and water, and then rubbing the mercury with a dry cloth.

S. M., of Ohio.—Your suggestions on the gyroscope are original, but we have no desire to continue the controversy.

T. W. B., of Ohio, and J. W. H., of Mass.—We are sorry that your communications are too lengthy for insertion, as the interest of the gyroscope has died away, and you will find our reason for alluding to it by referring to another answer to a correspondent. Your ideas are, however, worthy of consideration, and we have read them with satisfaction.

J. B., of Ohio.—Your idea that the globe is increasing in size is totally fallacious, and as you give us no facts to support your argument, we are surprised you can entertain such an opinion. That the polar relations of the earth may have changed is quite possible, but we do not for a moment believe that it has ever done so suddenly; indeed there is every reason to assume that all the changes of nature are gradual, and that whatever changes have taken place in the physical history of the world are now going on, and are continually at work.

L., of C. E.—The best method of protecting cast iron pipes is to have them enameled with a vitreous glaze either by borax or silica.

C. H., of S. C.—We are afraid that a life-preserver made of goose quills would not have all the desired qualities that are necessary in such an important article.

G. McC., of N. B.—These are evidently hard times to raise money on pearls in this market. Messrs. Ball, Black & Co., the largest dealers in this city, valued the specimen you sent us at 25 cents, and said that one of ½ inch in diameter would be worth from $5 to $25, according to its quality. You had better keep your pearls until the money market is easier, or you may send some to this office to pay for subscriptions, and we will credit you their worth.

D. B. T., of Ohio, inquires: "How would a nice, cheap machine that would cut magazines, and other uncut papers and pamphlets, 'take' and pay? Is there anything of the kind in the market?" We do not understand, from the above, whether your machine is for the use of binders, or an implement to be used by readers to cut leaves of pamphlets and magazines as they peruse them. If the former use is the intention, we would state that no binder is without a machine that accomplishes this purpose; but if the latter, and your invention is novel, and the implement is neatly made, we should think it would be useful, and would sell well. In making such an inquiry, you should have been more specific in stating in what your invention consisted.

C. H. Waters, of Clinton, Mass., would like to correspond with R. C. L., of St. Louis, who made an inquiry in regard to wire power looms. See correspondence column in No. 3, this volume.

J. L., of Miss.—By referring to the back volumes of the Scientific American, you will find illustrations of nearly all the modern pumps.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, October 17, 1857:—

G. C. G., of Ohio, $15; J. G. Jr., of Mich., $27; J. P. of N. Y., $20; L. K., of Ohio, $30; A. C. G., of Mass., $55; L. & M., of Mass., $30; J. N. J., of Mass., $50; L. & H., of Ohio, $25; W. H. A., of Ga., $30; C. R., of N. Y., $25; W. M., of Canada, $60; H. W. B., of N. J., $5; W. H. H., of Cal., $30; J. & J. L. F., of Tex., $30; F. G., of L. I., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Oct. 17, 1857:

F. A., of Conn.; G. & P., of Mich.; C. C. T., of Wis.; F. G., of L. I.; G. C. G., of Ohio; R. W. S., of N. Y.; J. N. J., of Mass.; E. D., of Wis.; W. W., of N. Y.; J. D. S., of N. Y.; W. H. H., of Cal.; A. C. G., of Mass.; H. W. B., of N. J.; L. & H., of Ohio.

Literary Notices.

The Ambrotype.—By Chas. A. Seely, A. M.: Seely & Garbanati, New York. This pamphlet gives plain directions and instructions in the whole art of ambrotypy, and seems to be thoroughly what it professes, namely, a practical treatise.

An Essay on the Preservation of Health—By Goodwyn Nixon, M. D., Lowndes, Ala., contains many valuable suggestions on the subject of which it treats, and is evidently written by one who is well acquainted with his subject in every phase. He even ventures on the poetry of health by prefixing each chapter with appropriate lines.

Blackwood's Edinburgh Magazine—American Edition—Published by Leonard Scott & Co., New York, contains Sir E. Bulwer Lytton's tale, "What will he do with it?" which every number becomes more entertaining, and adds fresh laurels to the fame of its author.

Hunt's Merchants' Magazine—Freeman Hunt, New York—may be regarded as one of the standard periodicals of the country, and as such it keeps up its reputation, by its promulgation of facts, mercantile, statistical and scientific.

The London Quarterly Review and the Edinburgh Review, re-published by Leonard Scott & Co., New York, still keep their place as first among the British Reviews, and for fearlessness of opinion, candor of expression, and talent in criticism, they are unequaled.

American Veterinary Journal.—S. N. Thompson & Co., Boston—is invaluable to every one who keeps a horse, and those who do not should read it that they may be well posted when they do.

The Southern Planter—Frank G. Ruffin, Editor, Richmond, Va.—In it all questions of Southern agriculture and general interest are ably treated.

TO OUR SUBSCRIBERS.

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Subscribers to the Scientific American who fail to receive their papers regularly, will oblige the publishers by stating their complaints in writing. Those who may have missed certain numbers can usually have them supplied by addressing a note to the office of publication.

Every Subscriber would do well to try and get one or more of his neighbors to send their names with his own, even if he has no wish to avail himself of our club rates. The larger the package of papers sent to one address, or the same Post Office, the greater is the certainty of getting the paper regularly. A single paper is sometimes mislaid or overlooked in sorting the mails at some one of the intermediate post offices through which it has to pass; while, on the contrary, we have noticed that a large package seldom fails to reach its proper destination.

TERMS OF ADVERTISING.

Twenty-five cents per line each insertion. We respectfully request that our patrons will make their advertisements as short as possible. Engravings cannot be admitted into the advertising columns.

⁂ All advertisements must be paid for before inserting.

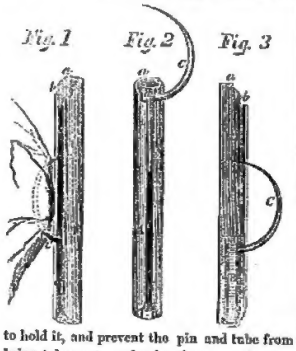
Science and Art.

Heilmann's Diaper Pin.

How often is the household harmony disturbed and a night's rest spoiled by the crying of the "flower of the flock," we mean the youngest baby, and how often is this the result of a simple pin! A careless nurse or hurried mother often inadvertantly hurts a poor baby very much by pinning a portion of its skin in combination with the diaper; and much more frequently does the pin itself become loose, and, as the nurse would say, "sticks into the the child of its own accord." None of us like a crying child, and none of us would willingly submit our "precious pets" to torture; and yet we do it every day, by an indiscriminate use of pins.

The simple and cheap invention which we are now about to describe will be a great acquisition to the nursery, and give peace to many a baby; it will also answer well as a safety pin for ladies' shawls, mantles, or other feminine "fixins," of which we must confess we do not know the names. In fact, wherever a common pin is required, this will answer just as well and with more safety.

Fig. 1 shows the pin when holding together any fabric; Fig. 2 is a view of it open, and Fig. 3 a section through the whole. A is a small metallic case or tube, having a slot, *c*, from end to end, in which slides the pin, C. In the tube, another cylinder of metal, considerably shorter, *d*, is free to move and hold the pin. B is an india rubber or other spring, one end fastened to the pin, and the other to the end of the tube, A, which is turned over



to hold it, and prevent the pin and tube from being taken out, as do also the two projections at the other end, *a*, at which end there are also two small grooves, one at each side of the slot, in which the pin can be slid when out, as seen in Fig. 2, and which prevent it from being pulled back while hooking anything into it. The operation is very simple: the pin is pulled into the position of Fig. 2, and the articles hooked into it, and then by turning the pin so that it will go down the slot, the spring will pull it home and retain it in the position shown in Figs. 1 and 3, from which it is impossible to shake it; and as the point is within the case, there is nothing exposed to hurt the child, and no likelihood of its becoming undone. It was patented July 1, 1857.

For further particulars and information, apply to the assignee, Ignatius Sturm, 32 John street, New York.

Improved Turbine Water Wheel.

This invention combines some new and useful improvements in constructing chutes for turbine water wheels, by which the user is enabled to impart the proper direction of the water when coming in contact with the wheel, also to regulate and govern the quantity discharged in a given length of time. When a quantity of water is passing through a turbine, if it comes out slower than the wheel revolves, it is evident that the wheel has to drag it somewhat, and thus it detracts from the speed of the arrangement; but, on the other hand, if the water is discharged faster than the revolution of the wheel, it is evident that all the force has not been abstracted from the water; and it is only when the discharge flows at exactly the same rate as the turning of the wheel, that the greatest motive power is obtained from the water.

This is effected in the invention before us by two devices:—the first, or Fig. 1, being stationary, and Fig. 2 being the rotating part. These are connected by a water tight flange joint, and fit into one another so that the bottom one can revolve freely around the other.

BASTION'S TURBINE WATER WHEEL.

Fig. 1

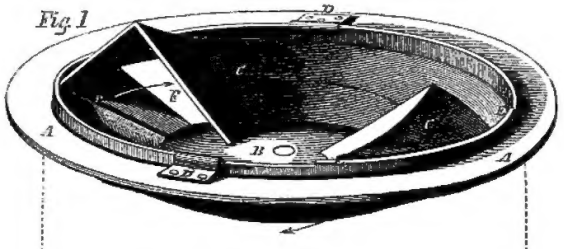
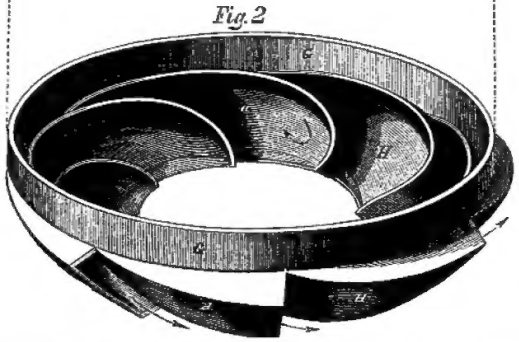


Fig. 2



They are separated in our engraving merely to show the construction of the lower half. In Fig. 1, A is the rim or band that is fixed to the stationary framework, and B the basin in which the water is received; C are two conical openings which can be turned round between the two catches, D, and are stopped from exceeding their course by the raised part of the rim, E. P is the fixed portion of A, against which C moves, and by that means lessens or enlarges the orifice for the discharge of water into the turbine, into which the water flows in the direction of the arrows.

Fig. 2 is a view of the turbine proper, in which G is the rim fitting on to the rim of A, and H are the buckets from whose peculiar shape the whole force of the water is extracted. The water strikes the bucket first at *a*, then, passing round in the direction of the arrow, expends its whole force against the bucket before leaving, which it does through the apertures, in the direction of the arrows. By these means whatever force can be obtained by the impingement of the water is obtained, and it flows away at the same rate which the wheel is revolving. It was patented May 6, 1856.

Further particulars and information may be obtained by applying to Bastion & Haddock, Theresa, New York.

Life-Saving Apparatus.

The queries we asked in an article entitled "Inventors to the Rescue!" in No. 4 of our present volume, have brought out many suggestions and propositions of various kinds from our correspondents, which we proceed to lay before our readers. One of the first and most important means of saving human life at a wreck on the ocean is the life-boat, and we have lately seen two good ones. The first is the gutta percha life-boat, made by the Lorcha Gutta Percha Life-boat Company, No. 37 Wall street, (Insurance Buildings,) this city. In a late number, we said something on the properties of this material, from which any one will be able to judge of its adaptability as an indestructable substance for a boat that manifestly has to undergo a vast amount of wear and tear. In our opinion, as regards the durability, strength and capabilities of working gutta percha, it is the very substance for a life-boat. As yet, however, a large one has not been made, and it remains to be seen how far the reasonable expectations of the patentee will be realized by actual trial. The method of manufacturing it is simple; the gutta percha is laid in a sheet over the female mold, the male mold is then pressed in on the principle of die stamping, and, after cooling, the boat is complete, with the exception of its fittings. The first cost would be a little more than wood or metal, but the material is always worth the same, and it is indestructible. It will not affect the compasses like a metal boat, and in every respect is superior to many of the materials which are often proposed for the same purpose.

Within the present year, Matthias Ludlum, of Fair Haven, Vt., has secured a patent for an improvement in life-boats, which promises to add to the safety of ocean navigation. He has one on exhibition at the Crystal Palace, for which Thos. Cartee, No. 205 Bowery, is agent. It is the ordinary life-boat, partly supported upon the elevated prow-shaped ends of two hollow air-tight floats, which are divided into air-tight chambers, so that the entire float cannot be destroyed. There are also two or more self-adjusting valves, and a continuous air-chamber, made in compartments, which are to be used for lockers and reservoirs. It does not occupy any more space than one of the old construction, and will not swamp, but immediately right and free itself of water.

It is surprising to us in view of the many lamentable catastrophes constantly occurring upon the seas, that comparatively so little attention is paid to life-preserving apparatus. Directors and managers of steamers deserve to be wrecked themselves for their indifference to this matter. Here are two improvements which deserve to be tried. It now remains to be seen how far they will receive attention.

Both devices have been secured by patents in Europe through the Scientific American Patent Agency.

To Gild Glass.

We have to thank a Trenton (N. J.) correspondent for the following information and receipt:—

"To make a small sign, take a piece of glass the required size, and clean it with alcohol or soap. Next, with a sharp penknife cut the back from a book of gold foil, and then, having licked with the tongue the plate of glass, (as saliva is the best sticking substance,) or if the glass is very large, use a weak solution of gum arabic, or the white of an egg in half a pint of water; now taking the leaves of the book off in order, lay them on the glass, or spread the leaves out and lay the glass on them, and it will take up the whole foil. When dry, which is known by the brilliant appearance of the foil through the glass, take a soft piece of canton flannel, and rub off all the loose pieces of foil; then with a rule draw two lines from end to end, the same distance apart, according to the hight of the letters wanted, and remove all the superfluous foil. Then place your cardboard letters on backward, and with a pointed stick mark all around the letter, and remove the waste foil. When the letters are all left in gold, paint the glass and the sign is finished."

MECHANICS' FAIR.—For the first time upon the Pacific coast, a mechanics' fair was to open at San Francisco on the 7th of September. A new and beautiful building had been erected for the purpose, and the whole affair seemed to promise a complete triumph.